developing and removing the first exposed portion and the second exposed portion;

heating the photosensitive organic insulation film; and

forming a reflection electrode onto a selected portion of the photosensitive organic insulation film.

107. (New) The method of claim 106, wherein the second mask is for an irregularly disposed circle pattern.

REMARKS

This is supplemental to the RCE filed December 6, 2002, and the amendment filed therewith. Herein, new claims 26-107 have been added. Thus, claims 8-14, 17, 19 and 22-107 are now pending.

Changes to Specification and Drawings for Purposes of Clarification

The specification and drawings have been amended to correct typographical errors therein. In particular, the specification as filed stated that Figs. 22-24 illustrated a process according to JP 9-90426 (e.g., see the instant specification as filed at page 3, lines 5-7). A review of JP 9-90426 illustrates that this is not the case. Figs. 22-24 as filed do not illustrate JP 9-90426. Thus, in order to correct the specification as filed, Figs. 22-24 as originally filed have been deleted, and new proposed Fig. 22 is attached hereto. Proposed Fig. 22 attached hereto is the mask used in JP 9-90426, so that the specification is now consistent. Since the specification as filed stated that JP 9-90426 was being

discussed and illustrated, new Fig. 22 taken from JP 9-90426 does not represent new matter.

37 C.F.R. Section 1.604

Several weeks ago, the Examiner handling the instant application informed the undersigned that the USPTO was considering an interference between the instant application and U.S. Patent No. 6,469,759. Thus, to the extent that Section 1.604(b) applies, the '759 Patent is hereby identified by the undersigned. Applicant looks forward to hearing from the USPTO as to whether an interference will be declared.

Support in Specification for Certain New Claims

Due to the number of new claim added herein, set forth below is a table for the purpose of illustrating example support in the specification as filed for subject matter recited in certain new claims. The table below is primarily for illustrating support for claims which include ranges or the like:

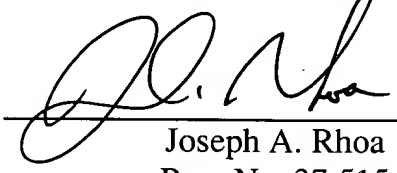
Claim #	**Example Support in Specification**
34, 45 (mj range)	page 29, lines 1 and 13
36, 47, 57, 73, 88, 93, 99 (5-50 μm)	page 21, lines 8-11
37, 48 (trans/refl)	page 53, line 6
52-55 (organic)	OFPR-800 & FE301N resins in specification are known as organic in the art (e.g., pg. 28, line 15; pg. 32, line 6; pg. 42, line 5)
58, 74, 89, 94 (more than 20%)	page 20, lines 14-20

59, 75, 90, 95 (less than 40%)	page 20, lines 6-10
60, 76, 91, 96, 98 (20 to 40%)	page 59, last line
61, 77 (<40%; >20%)	page 20, lines 6-20
62, 78, 92, 97 (30%)	page 32, line 20
63, 79 (1 to 5 μm)	page 32, line 8; page 42, line 7
64-67, 80-83 (3 μm)	page 32, line 9; page 42, line 8
68-69, 84-85	page 15, lines 10-15
70-71, 86-87	page 17, lines 7-14

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**" Please let the undersigned know if there should be any questions.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

From the paragraph beginning at page 2, line 24 to the paragraph ending at page 7, line 17:

Moreover, Japanese Unexamined Patent Publication JP-A 9-90426 (1997) discloses a technology to simultaneously expose an asperity forming pattern and contact holes using only one layer of a [positive] photosensitive resin in order to reduce the process of manufacturing a reflective-type liquid crystal display apparatus.

A method of manufacturing a reflective-type liquid crystal display apparatus described in this patent publication will briefly be described with reference to the drawings. In this regard, Fig. 22 illustrates a mask used in this reference (JP 9-90426).

[Fig. 22 is a cross-sectional view showing the structure of a reflective-type liquid crystal display apparatus formed by the manufacturing method described in the above-mentioned patent publication. Figs. 23A to 23E are cross-sectional views showing the flow of the manufacturing process.

As shown in Fig. 22, in]In the reflective-type liquid crystal display apparatus described in the above-mentioned patent publication, [a substrate in which a liquid crystal driving device 124 is formed is used as a reflecting substrate 123, and]the following are provided: an aluminum pixel electrode [110]disposed on the reflecting substrate[123]; a transparent electrode[112] opposed thereto; a color filter substrate[125] supporting the transparent electrode[112]; liquid crystal [111]sandwiched therebetween; [a phase

difference plate 115 disposed above the color filter substrate 125 (on the side of the surface not opposed to the liquid crystal);] and a polarizing plate 116 disposed above the phase difference plate 115.

[In the reflecting substrate 123, an amorphous silicon transistor is formed on a glass substrate 101 as the liquid crystal driving device 124. As shown in Fig. 22, the liquid crystal driving device 124 comprises Ta as a gate electrode 102 on the glass substrate 101, SiNx as a gate insulating layer 103, a-Si as a semiconductor layer 104, n-type a-Si as an n-type semiconductor layer 105, Ti as a source electrode 107, and Ti as a drain electrode 108. In the color filter substrate 125, a color filter 113 is formed on a glass substrate 114.]

A method of manufacturing the reflecting substrate [123] of the reflective-type liquid crystal display apparatus described in the above-mentioned patent publication will be described[with reference to Figs. 23A to 23E].

First, [as shown in Fig. 23A,]a [positive]photosensitive resin [109]is applied to the substrate[101].

Then, [as shown in Fig. 23B,]exposure is carried out [at high illuminance] using the [a] photomask [121]shown in Fig. 22 having a large light-blocking contact hole portion[s 130 as light transmitting portions] and in addition thereto, a plurality of smaller light [transmitt]blocking portions [118] at asperity form[ed]ing portions[, as shown in Fig. 24. All regions except the light transmitting portions 118 of the photomask 121 are light intercepting portion 117. In the case where light 122 is applied through the photomask 121 to the photosensitive resin 109, the light passes only through the light

transmitting portions 118. In the plan view of Fig. 24, the light intercepting portion 117 is hatched.]

Then, [as shown in Fig. 23C,]by development [with a developing solution, the resin in the exposed parts mentioned above is completely removed, so that] a resin configuration [that is positive] with respect to the mask pattern is formed.

[Then, as shown in Fig. 23D, by a heat treatment, the resin in the exposed regions is deformed into smooth asperities. However, at this time the exposed regions are flat because the resin has completely been removed by the above-described developing step.]

Then, [as shown in Fig. 23E, an Al]a thin film is formed as the reflecting electrode [110, and patterning is performed so that one reflecting electrode 110 corresponds to one transistor] over the asperities defined in the resin.

[The reflecting electrode 110 of the reflective-type liquid crystal display apparatus described in the above-mentioned patent publication is formed by the above-described process. In such a reflecting substrate 123, since the asperities are formed with the positive photosensitive resin in the exposed portions having been completely removed, the area of the flat part is large. In such a reflecting plate in which the area of the flat part is large, since the light source is projected in the flat region, the regular reflection component is large. Since display is difficult to confirm when the light source is projected, the regular reflection component generally is avoided in the case of the reflective-type display apparatus.

Therefore, the regular reflection component of the reflecting plate in the reflective-type liquid crystal display apparatus disclosed in the above-mentioned patent publication do not contribute to the brightness, which results in dark display.

Compared to the reflective-type liquid crystal display apparatus disclosed in JP-A 9-90426, previously-mentioned JP-A 6-75238 discloses a reflective-type liquid crystal display apparatus adopting a complicated asperity forming process in order to create an ideal scattering condition by improving the density of the asperities of the reflecting plate. According to this apparatus, after application of a first positive photosensitive resin, first exposure development of a sufficient intensity is performed. Then, after the patterning of the asperities are completely performed, the clearances of the asperities are completely filled so that the asperities are smooth. Then, a second positive photosensitive resin is applied in order to reduce the area of the flat part, and thereafter, only the patterning of the contact hole portions is again performed by performing second exposure development.

However, in this process, since the photosensitive resin is applied in two layers, it is necessary to perform the photoprocess (application - exposure - development - heat treatment) of the photosensitive resin twice, so that the cost clearly increases.

Further, in the reflective-type liquid crystal display apparatus disclosed in JP-A 9-90426, since one layer of a positive photosensitive resin is used, it is necessary to perform the photoprocess of the photosensitive resin only once, so that the process is simplified and cost reduction can be achieved. However, since it is necessary to ensure the removal of the photosensitive resin in the contact hole portions, it is inevitable that

the positive photosensitive resin in the exposed area in the asperity forming pattern portion is also removed. Consequently, the exposed area is flat, so that in the reflecting plate, the density of the asperities is low and the regular reflection component is large.

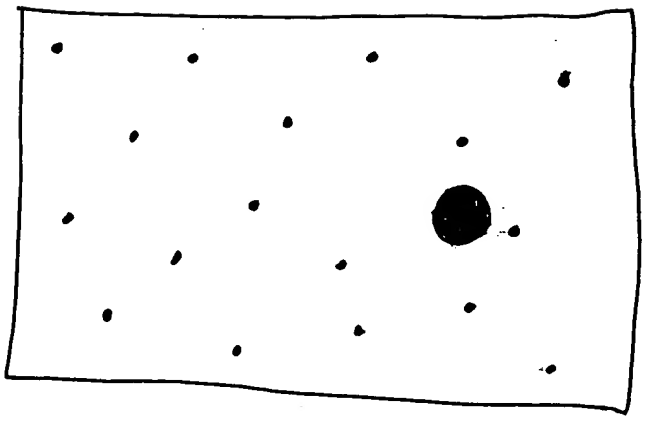
When dust or the like exists in the regions to be exposed for removing the photosensitive resin, the resin in the parts that are left unexposed cannot be removed by development. As a result, faulty electrical continuity occurs at contact holes and a signal input terminal portion.]

From the paragraph beginning at page 26, line 20 to the paragraph ending at page 27, line 4:

Fig. 22 is a [cross-sectional view showing the reflective-type liquid crystal display apparatus formed by the conventional manufacturing method;]plan view illustrating a conventional mask used in making a reflective LCD.

[Figs. 23A to 23E are cross-sectional views showing the manufacturing process of the reflecting substrate 123 in the conventional reflective-type liquid crystal display apparatus; and

Fig. 24 is a schematic plan view showing the patterns of the light transmitting portions 118 and the light intercepting portion 117 of the conventional photomask 121.]



Proposed New Fig. 22